Space Weather Forecast

Issued on Sunday 8 December 2024 at 00:21 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Daily chance of Moderate-class X-ray flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate activity was observed, initially peaking at 07/1308UTC from a sunspot region in the southeast, but later trumped by a similar-sized flare from a sunspot regon in the northwest at 07/2215UTC.

The southeastern sunspot group is currently the most complex region on the facing side, although assessment has been rendered difficult given the relatively lower resolution of currently available imagery.

There are now up to seven regions on the facing side. There were no obvious major changes observed in the current front sided spot groups the period.

No Earth-directed Coronal Mass Ejections (CMEs) were observed in the last 24 hours, however there remain numerous large 'filaments' (arcs of plasma) on the Sun, especially in the southeastern quadrant, with the largest of these now nearing the solar meridian to perhaps warrant closer attention (should it lift off as a CME it is more likely to intersect the Sun-Earth line).

Solar Wind / Geomagnetic Activity: Solar winds were reflective of a slow regime for the most part, although a Solar Sector Boundary Crossing (SSBC) occurred around 07/1800UTC. Recent rises in solar wind speed and decreases in density may yet reflect an unexpected entry into the fast wind from a southern coronal hole - this will become clearer in the coming hours, however geomagnetic activity is not expected to increase significantly.

The solar wind speed fell within background levels. The number of particles in the solar wind was slightly elevated, perhaps indicating Earth is transiting the current sheet, or hinting at a close pass from the fast wind from a relatively solar pole-ward coronal hole. The associated magnetic field was slightly elevated at peak, with a smaller-scale and erratic north-south component.

The net result of the above solar wind measures was nevertheless for provisionally quiet geomagnetic activity throughout.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 370 900 0100 Email: enquiries@metoffice.gov.uk

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Solar Activity: There is a now slightly increased, but hereafter level daily 'chance' of isolated Moderate-class flares, with no significant sunspot region departures, but perhaps one imminent significant returning region.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs that feature in the forecast. Initially slow solar winds may give way to a fast wind during day two (Monday 09 December), although any effect is likely to be muted given our proximity to the solstice.

Quiet geomagnetic conditions may become a little more restive from day two, Monday 09 December, but probably again easing through midweek UTC and remaining below Minor Geomagnetic Storm G1 even at peak.

Energetic Particles / Solar Radiation: There is a slight chance that the recent Moderate-class X-ray activity near the western solar horizon may produce an S1-scale (Minor Solar Radiation Storm) enhancement, giving a modest rise in the risk within day one (Sunday 08 December), otherwise no solar radiation storms are expected.

Geomagnetic Storms

Geomagnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	1	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 (M Class)	Yes	50	50	50	50
Very Active	R3-R5 (X Class)	No	5	5	5	5

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	5	5	5
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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